[00143] What is claimed is:

1. A method comprising:

estimating features of a mouth in a current image of a sequence of digital images of a human face by deriving a deformable mouth model template in an iterative process, said process including:

minimizing an energy function receiving iteration-dependent arguments to determine optimal transformation parameters of an iteration-dependent transformation; and

transforming components of said deformable mouth model template by said iteration-dependent transformation having said optimal transformation parameters.

2. The method of claim 1, wherein said process further includes:

initializing said deformable mouth model template according to a base image of said sequence.

3. The method of claim 1, wherein estimating said features includes estimating positions of lips of said mouth.

4. The method of claim 1, wherein estimating said features includes estimating shapes of lips of said mouth.

5. The method of claim 1, wherein estimating said features includes estimating positions of teeth in said mouth.

6. The method of claim 1, further comprising:

double-blurring particular digital images of said sequence to produce double-blurred images; and

double-filtering maps derived from said current image to produce double-filtered maps,

wherein for a particular iteration, minimizing said energy function includes minimizing said energy function receiving said double-blurred images and said double-filtered maps, and said iteration-dependent transformation is a coarse transformation.

7. The method of claim 6, wherein double-blurring said particular digital images includes double-blurring said current image, double-blurring a previously processed image of said sequence and double-blurring a base image of said sequence.

8. The method of claim 6, wherein double-filtering said maps includes double-filtering a spatial luminance peaks and valleys map derived from said current image and double-filtering a vertical intensity gradient map derived from said current image.

9. The method of claim 6, wherein double-filtering said maps includes applying a dilate morphological operator recursively to said maps.

10. The method of claim 6, wherein said coarse transformation represents a relative displacement of a center of said mouth.

11. The method of claim 1, further comprising:

blurring particular digital images of said sequence to produce blurred images; and

filtering maps derived from said current image to produce filtered maps,

wherein for a particular iteration, minimizing said energy function includes minimizing said energy function receiving said blurred images and said filtered maps, and said iteration-dependent transformation is a fine transformation.

12. The method of claim 11, wherein blurring said particular digital images includes blurring said current image, blurring a previously processed image of said sequence and blurring a base image of said sequence.

13. The method of claim 11, wherein filtering said maps includes filtering a spatial luminance peaks and valleys map derived from said current image and filtering a vertical intensity gradient map derived from said current image.

14. The method of claim 11, wherein filtering said maps includes applying a dilate morphological operator to said maps.

15. The method of claim 11, wherein said fine transformation is a lip transformation that represents a relative displacement of a center of said mouth, a relative stretching of said mouth and a relative opening of the jaw of said mouth.

16. The method of claim 11, wherein said fine transformation is a teeth transformation that represents a relative opening of the jaw of said mouth.

17. The method of claim 1, wherein for a particular iteration, said iteration-dependent transformation is a superfine transformation and minimizing said energy function includes minimizing said energy function receiving said current image, a previously processed image of said sequence, a base image of said sequence, a spatial luminance peaks and valleys map derived from said current image, and a vertical intensity gradient map derived from said current image.

18. A method comprising:

estimating features of a mouth in a current image of a sequence of digital images of a human face by deriving a deformable mouth model template, wherein deriving said deformable mouth model template includes:

minimizing an energy function to determine optimal transformation parameters of a transformation; and

transforming components of said deformable mouth model template by said transformation having said optimal transformation parameters,

wherein said energy function includes a bound energy term to ensure that said deformable mouth model template represents a physiologically possible state of said mouth.

19. The method of claim 18, wherein said deformable mouth model template includes contours representing upper and lower boundaries of an upper lip of said mouth, and contours representing upper and lower boundaries of a lower lip of said mouth,

wherein said energy function is a lips energy objective function, and

wherein said bound energy term penalizes lip shapes and lip positions that vary too greatly from lip shapes and lip positions of said mouth in a base image of said sequence.

20. The method of claim 18, wherein said deformable mouth model template includes inner and outer lip contours representing upper and lower lips of said mouth and teeth contours representing upper and lower teeth of said mouth,

wherein said energy function is a teeth energy objective function, and

wherein said bound energy term penalizes any occurrence of said teeth contours overlapping and any occurrence of said teeth contours not located between said inner lip contours.

21. A method comprising:

estimating features of a mouth in a current image of a sequence of digital images of a human face by deriving a deformable mouth model template, wherein deriving said deformable mouth model template includes:

minimizing an energy function to determine optimal transformation parameters of a transformation; and

transforming components of said deformable mouth model template by said transformation having said optimal transformation parameters,

wherein said energy function includes an elastic spline energy term to attract contours of said deformable mouth model template to respective parabolas.

22. The method of claim 21, wherein said elastic spline energy term is zero for coarse transformations and for fine transformations.

23. The method of claim 21, wherein said energy function is a lips energy objective function and said elastic spline energy term is related to a square of a width of said mouth in a base image of said sequence.

24. A method comprising:

estimating features of a mouth in a current image of a sequence of digital images of a human face by deriving a deformable mouth model template, wherein deriving said deformable mouth model template includes:

minimizing an energy function to determine optimal transformation parameters of a transformation; and

transforming components of said deformable mouth model template by said transformation having said optimal transformation parameters,

wherein said energy function includes a teeth gap energy term to describe vertical gaps between the upper teeth and lower teeth.

25. The method of claim 24, wherein said energy function is a lips energy objective function.

26. The method of claim 24, wherein said energy function is a teeth energy objective function and said teeth gap energy term also describes vertical edges of teeth and an absence of teeth in a cavity of said mouth.

27. A method comprising:

estimating features of a mouth in a current image of a sequence of digital images of a human face by deriving a deformable mouth model template, wherein deriving said deformable mouth model template includes:

minimizing an energy function to determine optimal transformation parameters of a transformation; and

transforming components of said deformable mouth model template by said transformation having said optimal transformation parameters,

wherein said energy function includes a texture energy term to describe texture differences in lips and corners of said mouth compared to a different image of said sequence.

28. The method of claim 27, wherein said different image is a base image of said sequence.

29. The method of claim 27, wherein said different image is a previously processed image of said sequence.

30. A method comprising:

estimating features of a mouth in a current image of a sequence of digital images of a human face by deriving a deformable mouth model template, wherein deriving said deformable mouth model template includes:

minimizing an energy function to determine optimal transformation parameters of a transformation; and

transforming components of said deformable mouth model template by said transformation having said optimal transformation parameters,

wherein said energy function includes a corner energy term that attracts lip corners to an area having a particular vertical intensity gradient structure.

31. The method of claim 30, wherein said corner energy term includes a sum of products of a vertical intensity gradient and a kernel in a left corner of said mouth and in a right corner of said mouth.

32. The method of claim 30, wherein said corner energy term is zero for coarse transformations.

33. A method comprising:

modeling features of a mouth in a current image of a sequence of digital images of a human face by a deformable mouth model template including a first contour to represent a lower boundary of upper teeth of said mouth and a second contour to represent an upper boundary of lower teeth of said mouth.

34. The method of claim 33, wherein said deformable mouth model template further includes a first center control point located substantially on the center of said first contour, a second center control point located substantially on the center of said second contour, a right control point common to said first contour and said second contour to represent a right corner of said mouth, and a left control point common to said first contour and said second contour to represent a left corner of said mouth.

35. The method of claim 34, wherein said deformable mouth model template further includes a first left-center control point located on said first contour between said left control point and said first center control point, a second left-center control point located on said second contour between said left control point and said second center control point, a first right-center control point located on said first contour between said right control point and said first center control point, and a second left-center control point located on said second contour between said right control point and said second center control point.

36. An article comprising a storage medium having stored thereon instructions that, when executed or interpreted by a computing platform, result in:

estimating features of a mouth in a current image of a sequence of digital images of a human face by deriving a deformable mouth model template in an iterative process, said process including:

minimizing an energy function receiving iteration-dependent arguments to determine optimal transformation parameters of an iteration-dependent transformation; and

transforming components of said deformable mouth model template by said iteration-dependent transformation having said optimal transformation parameters.

37. The article of claim 36, wherein said features include positions and shapes of lips of said mouth.

38. The article of claim 36, wherein said features include positions of teeth in said mouth.

39. An article comprising a storage medium having stored thereon instructions that, when executed or interpreted by a computing platform, result in:

modeling features of a mouth in a current image of a sequence of digital images of a human face by a deformable mouth model template including a first contour to represent a lower boundary of upper teeth of said mouth and a second contour to represent an upper boundary of lower teeth of said mouth.

40. The article of claim 39, wherein said deformable mouth model template further includes a first center control point located substantially on the center of said first contour, a second center control point located substantially on the center of said second contour, a right control point common to said first contour and said second contour to represent a right corner of said mouth, and a left control point common to said first contour and said second contour to represent a left corner of said mouth.

41. The article of claim 40, wherein said deformable mouth model template further includes a first left-center control point located on said first contour between said left control point and said first center control point, a second left-center control point located on said second contour between said left control point and said second center

control point, a first right-center control point located on said first contour between said right control point and said first center control point, and a second left-center control point located on said second contour between said right control point and said second center control point.